

PEO Missiles and Space Overview Briefing for the 2010 Corrosion Summit

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Presented by:
Program Executive Office
Missiles and Space



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PROGRAM EXECUTIVE OFFICE MISSILES AND SPACE

MISSION:

**Provide an Unprecedented Level of Service and Support
for the Systems for Which We are Responsible**

What We Do:

- Centralized Management for All Army Tactical and Air Defense Missile Programs and Selected Army Space Programs
- Full Life-Cycle Management of Assigned Systems
- World Wide Support of Fielded Weapon Systems
- Key Link Between the User and Tech Base

What We Manage:

- Nine Project Offices
- Thirteen ACAT I, Two ACAT II and Eight ACAT III Programs
- Two International Cooperative Development Programs



Government Workforce
~1,000
(Civilian and Military)

Managing

FY10
Appropriated Funding > \$3.0B
FMS > \$13B, 35 Countries

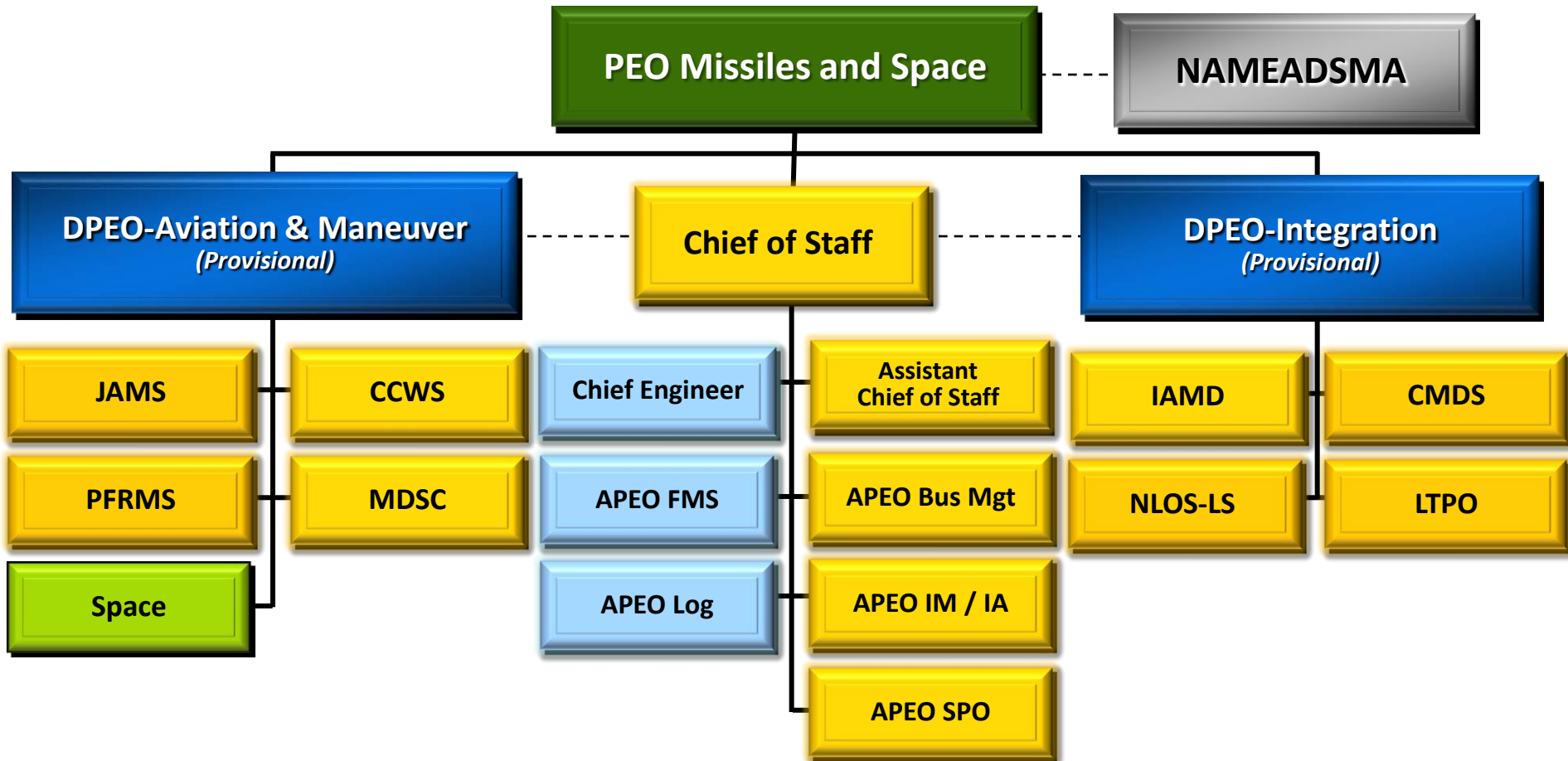
To

Support the Warfighter

PEO MS Vision: Be the Trusted Worldwide Provider of Missile Systems for Our Allies and U.S. Warfighters with Uncompromising Service in Development, Procurement, and Sustainment



PEO MS Organizational Structure



Matrix Support

PEO Missiles and Space Portfolio

Program Executive Officer

Deputy Program Executive Officer - Aviation and Maneuver

Deputy Program Executive Officer - Integration

Joint Attack Munition Systems (JAMS)

Hydra-70



Joint Air-to-Ground
Missile (JAGM)



Hellfire



Viper Strike



Close Combat Weapon Systems (CCWS)



Javelin

Improved
Bradley
Acquisition
Subsystem
(ITAS)



Tube-Launched,
Optically-Tracked,
Wire-Guided (TOW)



Improved Target
Acquisition System
(ITAS)



Non-Line of Sight Launch System (NLOS)



Container Launch
Unit (CLU)

Precision Attack
Missile (PAM)



Cruise Missile Defense Systems (CMDS)



Joint Land Attack
Cruise Missile Defense
Elevated Netted
Sensor System (JLENS)

Surface Launched Medium
Range Air-to-Air Missile
System (SLAMRAAM)



SENTINEL



STINGER



AVENGER

Precision Fires Rocket and Missiles Systems (PFRMS)



Guided Multiple Launch
Rocket Systems (GMLRS)

Army Tactical Missile
Systems (ATACMS)



High Mobility Artillery
Rocket System (HIMARS)

Upper Tier Project Office (UTPO)



Responsive Space Operations (RSO)



Integrated Air and Missile Defense (IAMD)



Lower Tier Project Office (LTPO)



PATRIOT



PATRIOT
Advanced
Capability (PAC-3)



Medium Extended
Air Defense
System (MEADS)



Missile
Segment
Enhancement (MSE)

Joint Tactical
Ground Station
(JTACS)





The Cost of Corrosion

Rank (Out of 20)	LIN	Nomenclature	Maintenance Cost (\$M)	Corrosion Cost (\$M)	% of Maintenance Cost Due to Corrosion
13	L45740	Launcher Tubular Guided Missile	\$55.7	\$10.8	19.4%
16	P11779	PATRIOT: PAC-3 Launcher Station	\$150.3	\$8.2	5.5%
20	L44830	Launcher; guided missile aircraft	\$41.9	\$6.4	15.3%
			\$247.9	\$25.4	10.2%

- **OSD Cost of Corrosion Study related to Army Aviation and Missiles**

- ❑ **OSD Sponsored AMCOM Cost of Corrosion Study*** estimated that AMCOM spent approximately \$1.6 Billion in 2005 for corrosion maintenance actions where more maintenance dollars were spent on Corrective maintenance versus Preventive Maintenance on weapon systems.
- ❑ **The Cost of Maintenance Due to Corrosion for Missile Systems Ranged from Roughly 5% to 20% of Total Cost of Maintenance for the Missile Systems Studied**

** The Annual Cost of Corrosion for Army Aviation and Missile Equipment, Report No SKT50T3*



The Other Costs of Corrosion

Rank (Out of 20)	LIN	Nomenclature	Maintenance Cost (\$M)	Corrosion Cost (\$M)	% of Maintenance Cost Due to Corrosion
13	L45740	Launcher Tubular Guided Missile	\$55.7	\$10.8	19.4%
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			\$247.9	\$25.4	10.2%

- **The Cost Of Corrosion Is Not Only Monetary**
 - ❑ Increased Equipment Down Time
 - ❑ Reduced Readiness Levels
 - ❑ Reduction Or Loss Of Mission Capability
 - ❑ Potential Impact To The Warfighter



Approach to Corrosion Prevention and Control

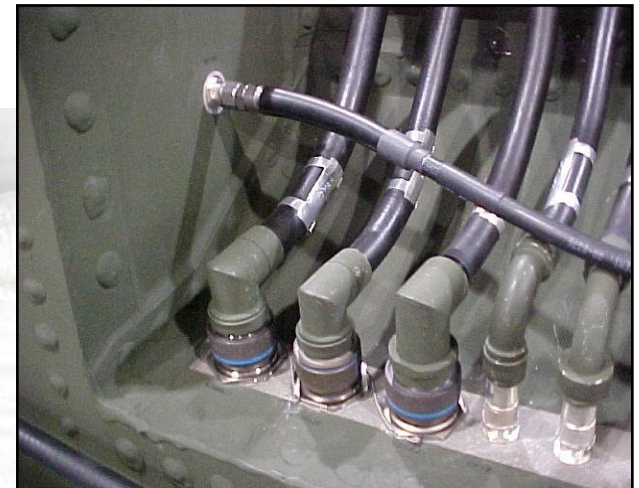
- **PEO MS Participates In RDECOM Corrosion IPT With PEO/User Representatives And Corrosion Experts**
- **PEO MS Membership/Representation In The AMCOM Corrosion Prevention And Control (CPC) IPT**
- **PEO MS Project Offices, With The Support Of AMRDEC Corrosion Office, Are Working To Identify, Develop And Implement Technologies To Prevent And Minimize The Effects of Corrosion And The Resulting Maintenance Costs**
- **Where Feasible, Leverage Technologies And Funding From/Across Both Aviation And Missile Systems**



Ongoing CPC Initiatives

- PATRIOT Cable Connector Boot -

- AMCOM Corrosion Program Office Worked With The LTPO To Develop A Dem/Val Of A Commercial Off The Shelf (COTS) Connector Boot Widely Used In Commercial Aviation Aircraft Electronic Cable Assemblies.
- Project Focus Was To Demonstrate The Technology In A Field Situation To Reduce/ Eliminate Corrosion Of Cable Connectors And Validate Military Application Of The Technology.
- The Project Was A Success On Both Counts. The Technology Is Being Implemented Through An Engineering Change Proposal.





Ongoing CPC Initiatives

- PATRIOT Canister Covers -

Corrosive Effects of “Open Revetment” Storage



PATRIOT Missile Canisters



Ongoing CPC Initiatives

- PATRIOT Canister Covers -

- **Dem/Val Project Initiated By AMCOM Corrosion Program Office To Cover Missile Canisters Stored In Open Revetment Munitions Storage Area.**
 - Missile Canisters Were Sustaining Severe Corrosion Damage.
 - Desiccant Replacement Intervals Were As Frequent As Every 4 Weeks.
- **Demonstration Of 2 Commercial Off The Shelf (COTS) Materials - Into Its Second Year Employing An Improved Second Generation Cover Material**
 - Laminated Fabric/Material That Is Air Permeable, Waterproof; And Contains A Hydrophobic Polytetrafluoroethylene (Eptfe) Membrane.
 - Waterproof Material, Containing A Moisture Absorbent Liner And A Vapor Corrosive Inhibitor.
- **Corrosivity Sensors Used In The Project Revealed The Rate Of Corrosion Under Both Covers To Be About The Same As In A Typical Indoor Office.**
- **Desiccant Change Experience For Canisters Under Both Covers Has Been As Long As 6 Months (Because The Missiles Are Rotated Out Of Munitions Storage Every 6 Months).**





Ongoing CPC Initiatives

- PATRIOT Canister Covers -



2 Canister Cover, < \$ 5 K ea

Waterproof
Corrosion Vapor Inhibitor
Moisture Absorbent Liner

Less Frequent Desiccant Changes

With Cover 7 months & counting

Without Cover 5 to 8 Weeks

PATRIOT Missile Canister Covers Project



2 Canisters w/Missiles - \$ 11+ M

Waterproof
Breathable Membrane
Light-Weight

Mar 2009



Ongoing CPC Initiatives

- PATRIOT Radar Dehumidification -

- Dem/Val Project Initiated By AMCOM Corrosion Program Office To Dehumidify The Interior Of The PATRIOT Radar Sets In Highly Corrosive Locations.
- The Project Has Integrated A Commercial Off The Shelf DH Technology To Continuously Purge The Radar With Very Dry Air.
- Project Is In Its Second Year.
- Although Corrosivity Sensor Data Reflects Considerably Lower Corrosion Rates Inside The Radar As Compared To The Outside Ambient, Maintenance Records Will Be Analyzed At The End Of The Project To Determine Extent Of The Project's DH Success.





Ongoing CPC Initiatives

- PATRIOT Radar Dehumidification -



**Dehumidifying
PATRIOT Radar Sets**



**\$ 13 K Dehumidification Unit
vs.
\$ 38 M PATRIOT Radar Set**

Feb 2009



Ongoing CPC Initiatives

- CPC Training -

AMCOM Corrosion Program Office Develops Unit Level CPC Training Materials, Guide Books, SOPs And CD-ROMs.

Training Teams Are Periodically Sent World-wide To Train The War Fighters Who Are The First Line Of Defense In Combating Corrosion.

The Training Usually Consists Of A Half Day Of Classroom Refresher/Familiarization Training Followed By An Afternoon Of Hands-on Training Using The Latest CPC Technologies.





Ongoing CPC Initiatives

- Other Items -

- **CPC Plans for PFRMS, CMDs, SLAMRAAM, and JLENS**
- **M299 Launcher CPC Plan/Redesign/Reset Support**
- **HELLFIRE Warhead Coating Evaluation**
- **HIMARS Corrosion Assessment and CPC Training**
- **MLRS Corrosion Assessment at Ft. Sill**



Potential CPC Project Areas

- **New Materials**
- **Protective Coatings**
- **Non-Destructive Inspection Techniques**
- **Sensors and Predictive Tools**
 - ❑ Where Possible, Leverage Efforts Conducted under the Condition Based Maintenance (CBM) Program
 - ❑ Current CBM Efforts Include Health Monitoring Units (HMU) To Monitor Humidity, Temperature, etc., For Use In Determining Weapon System “Health”



The Acquisition Side of Corrosion Prevention and Control

- **Ensure That PEO MS Acquisition Documentation Addresses CPC Requirements**
 - ❑ Per DFAR/DODI 5000.02, CPC Plan Must Be Addressed In Acquisition Plan/Strategy Documentation
 - ❑ **EXAMPLE:**
 - **Joint Attack Munitions Systems (JAMS) Project Office**
“Corrosion Prevention And Control Management Plan”,
Dated February 2009
 - ✓ Establishes JAMS Program Corrosion Prevention Advisory Team (CPAT) And Assigns Responsibilities
 - ✓ Provides Guidance On Establishing CPC Baseline Requirements
 - ✓ Assigns Corrosion Prevention Responsibilities
 - ✓ Establishes Contractor CPC Responsibilities
 - ✓ Other Guidance/Responsibilities



Path Forward

- **Continue Coordination With AMRDEC Corrosion Office And AMCOM CPC IPT**
- **Ensure That PEO MS Systems Address CPC In Acquisition Documentation**
- **Leverage Technology And Lessons Learned Across The PEO MS Family Of Systems As Well As AMCOM/LCMC Organizations**